

# On two large specimens of *Zu cristatus* (Trachipteridae) from the Gulf of Genoa (NW Mediterranean)

by

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**RÉSUMÉ.** - À propos de deux grands spécimens de *Zu cristatus* (Trachipteridae) dans le golfe de Gênes (Méditerranée nord-occidentale).

Deux spécimens de *Zu cristatus* (Bonelli, 1820) ont été capturés dans le golfe de Gênes (mer Ligure). L'un d'eux est le plus grand spécimen capturé en Méditerranée. Des analyses morphométriques et méristiques ont été effectuées sur les deux spécimens et les données morphologiques disponibles de cette espèce sont discutées.

Key words. - Trachipteridae - *Zu cristatus* - MED - Ligurian Sea - Size record.

The scalloped ribbonfish *Zu cristatus* (Bonelli, 1820) is a cosmopolitan species occurring in all oceans ranging from tropical to temperate waters (Froese and Pauly, 2005). Even if considered mesopelagic, the species has been found in a wide depth range (0-800 m) in particular young individuals have occasionally been observed freely swimming in shallow waters or captured just a few metres from the shore (Costa, 1842; Heemstra and Kannemeyer, 1984; Bianco *et al.*, 2006).

In the Mediterranean, the scalloped ribbonfish has occurred throughout the entire basin with the exception of the northern parts of the Adriatic and Aegean Seas (Fischer *et al.*, 1987). However, wherever it occurs, *Z. cristatus* is considered as an occasional species, much rarer than the other ribbonfish *Trachipterus trachipterus* (Gmelin, 1789) also occurring in the Mediterranean (Tortonese, 1958).

According to Heemstra and Kannemeyer (1984), the species attains 1180 mm SL (extra-Mediterranean specimens), but individuals longer than 800 mm SL have rarely been reported. To the best of our knowledge, the two largest individuals claimed for the Mediterranean, are a 1105 mm TL (2800 g TW) specimen captured by a bottom long-line off Genoa (Tortonese, 1958) and a 1115 mm TL (2160 g TW) specimen trawled 15.5 nautical miles off Calella in the Catalan Sea (Roig and Demestre, 1982).

## MATERIAL AND METHODS

Two specimens of *Z. cristatus* (Ge/1 and Ge/2) were collected from the Gulf of Genoa (Ligurian Sea) (Fig. 1) by professional bottom trawlers in May and August 2003 between -150 and -400 m, and frozen at -70° C. In the laboratory biometric and meristic analyses of the two specimens were carried out and then compared with the data on other Mediterranean individuals available in the literature. Measurements were taken to the nearest mm. Total weight

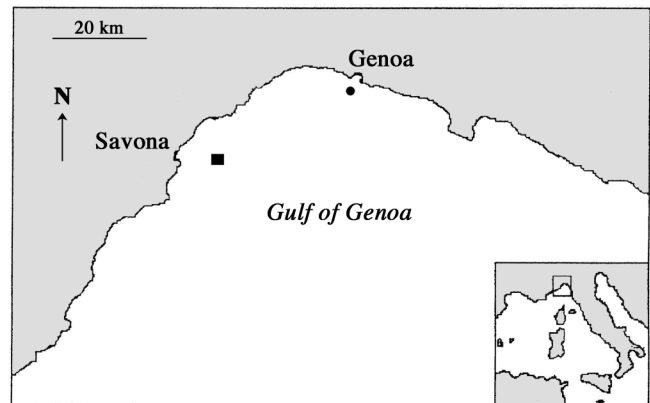


Figure 1. - Map showing the localities of the catches of the two specimens of *Zu cristatus*, G/1 (●) and G/2 (■) in the Gulf of Genoa (Ligurian Sea). [Carte indiquant les localités de capture des deux exemplaires de *Z. cristatus*, G/1 (●) et G/2 (■) dans le golfe de Gênes (mer Ligure).]

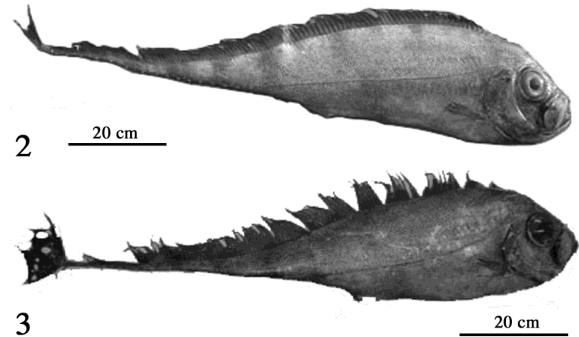


Figure 2. - Specimen of *Zu cristatus*, 1219 mm TL, 4400 g TW, captured in the Gulf of Genoa (Ligurian Sea). [Spécimen de *Z. cristatus* capturé dans le golfe de Gênes (mer Ligure).]

Figure 3. - Specimen of *Zu cristatus*, 1031 mm TL, 2292 g TW, captured in the Gulf of Genoa (Ligurian Sea). [Spécimen de *Z. cristatus* capturé dans le golfe de Gênes (mer Ligure).]

(TW) was taken by means of a digital balance to an accuracy of 0.01 g. The relationship TL/TW was also calculated. Furthermore the specimens were dissected in order to establish sex and to gather information on stomach contents. Both specimens were deposited in the Civic Museum of Natural History "Giacomo Doria" of Genoa as MSNG 52911 for Ge/1 and MSNG 52912 for Ge/2.

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Table I. - Measurements (in mm) and counts of the two specimens of *Zu cristatus* (Ge/1, Ge/2), compared with the available data given by Tortonese (1958) and by Roig and Demestre (1982) for two previous large Mediterranean individuals. For each specimen, morphometric measurements are expressed either as absolute values or as percentage (%) of Standard Length (SL). \* indicates that the parameter is not given by the author/s. [Mesures (en mm) et données numériques pour les deux spécimens de *Z. cristatus* (Ge/1, Ge/2), comparées aux données fournies par Tortonese (1958) et par Roig et Demestre (1982) pour deux autres grands spécimens méditerranéens. Pour chaque spécimen, les mesures morphométriques sont indiquées soit en valeurs absolues, soit en pourcentage (%) de la longueur standard (SL). \* indique que le paramètre n'est pas fourni par les auteurs.]

Specimen	Absolute Ge/1	as % of SL Ge/1	Absolute Ge/2	as % of SL Ge/2	Absolute Tortonese, 1958	as % of SL Tortonese, 1958	Absolute Roig & Demestre, 1982	as % of SL Roig & Demestre, 1982
Date of capture	26 Aug. 2003	-	16 May 2003	-	Aug. 1958	-	10 Jun. 1980	-
Depth of capture	150 m	-	400 m	-	700-800 m	-	380 m	-
Standard length (mm)	1105	-	926	-	980	-	1000	-
Total length	1219	110.3%	1031	111.3%	1105	112.8%	1115	111.5%
Snout to vent	554	50.1%	415	44.8%	465	47.4%	450	45.0%
Greatest body depth	218	19.7%	197	21.3%	210	21.4%	205	20.5%
Body depth at anus	129	11.7%	119	12.9%	*	-	*	-
Head length	191	17.3%	153	16.5%	160	16.3%	165	16.5%
Preocular length	62	5.6%	45	4.9%	55	5.6%	50	5.0%
Eye diameter	68	6.2%	53	5.7%	57	5.8%	*	-
Maxilla width	46	4.2%	33	3.6%	*	-	*	-
Lower jaw length	102	9.2%	89	9.6%	*	-	*	-
Minimum height	8	0.7%	5	0.5%	7	0.7%	*	-
Caudal fin length	114	10.3%	106	11.4%	125	12.8%	115	11.5%
Pectoral fin length	67	6.1%	60	6.5%	65	6.6%	70	7.0%
Dorsal fin max height	73	6.6%	152	16.4%	70	7.1%	*	-
Dorsal fin rays	130	-	125	-	125	-	117	-
Pectoral fin rays	11	-	10	-	10	-	11	-
Caudal fin rays	9	-	9	-	9+1	-	9+4	-
Lateral line scales	96	-	102	-	*	-	*	-
Gill rakers	3+8	-	3+7	-	2+9	-	10	-
Teeth upper jaw	21	-	14	-	*	-	*	-
Teeth lower jaw	10	-	10	-	*	-	*	-
Palatin teeth	4	-	4	-	*	-	*	-
Vomerin teeth	4	-	3	-	*	-	*	-
Total weight (g)	4400	-	2292	-	2800	-	2160	-
TL/TW	0.28	-	0.45	-	0.39	-	0.52	-

## RESULTS AND DISCUSSION

Biometric and meristic data of our samples are summarised and compared with those of two other large Mediterranean specimens (Tab. I). The larger individual (Ge/1) measured 1219 mm in TL and 4400 g in TW (Fig. 2), while the lesser one (Ge/2) was 1031 mm in TL and 2292 in TW (Fig. 3). No morphometric differences were found, with the only exception of the “dorsal fin max height” of the Ge/2 specimen, which was significantly higher when compared with the Ge/1 specimen and with the other individuals considered in this study. Both specimens were adult females with empty stomachs and ovaries containing developed oocytes of 1-1.5 mm in diameter.

The scalloped ribbonfish is considered occasional probably due to its mesopelagic habits, which make it difficult to sample (Tortonese, 1958). In the Italian waters, *Z. cristatus* has been recently recorded in the central Tyrrhenian Sea, on the Bank of Santa Croce (Bianco *et al.*, 2006) and off the coast of Anzio (Psomadakis *et al.*, 2006). Furthermore single records have been reported (Tortonese, 1958; Gavagnin, 1976). Our records underline the importance of the Ligurian waters as a major site for exceptional ichthyological findings, probably due to the peculiar hydrological conditions and

to the morphology of the coastline, which favours the encounter of rare deep and open water species (Ariola, 1904; Boero and Carli, 1977; Orsi Relini and Costa, 1987; Orsi Relini *et al.*, 1995).

The weight of Ge/1 specimen is considerably heavier than the other specimens (Tab. I). The largest specimen (Ge/1) described in the present study represents the new size record for the species in the Mediterranean Sea. The morphometric and meristic data given by previous authors (Tortonese, 1958; Roig and Demestre, 1982) for two other large Mediterranean individuals are in accordance with the characteristics of our specimens. Only the counts of the lateral line scales and dorsal fin rays, showed a significant difference, probably because these structures are easily damaged. The only true biometric disproportion concerned the “dorsal fin max height”. This value was obtained from a single dorsal ray in the Ge/2 specimen; although broken in different points, it was still connected by membrane allowing us to measure the broken segments and to appreciate the true length of this ray. It is interesting to note that this ray is not one of the first 5 or 6, which are known to be greatly elongated in young individuals of the species (Palmer, 1961), but it was positioned well behind (35th dorsal ray), approximately at mid point of the fish length. We can infer that a possible damage of these fragile structures occurred during the capture.

As in other trachipterids, *Z. cristatus* presents distinctive body changes throughout its life cycle, with major differences involving the loss of the elongated anterior dorsal fin rays and pelvic fins during the transition from prejuvenile to juvenile stages, which seems to occur in the 600-800 mm size range (Heemstra and Kannemeyer, 1984). However, the extent and timing of allometric growth and morphological changes occurring at different stages is still not fully understood and needs further investigations.

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